

REMARKS FOR DEPUTY ADMINISTRATOR GARVER
WOMEN IN AEROSPACE
June 1, 2012

Thank you Minda for inviting me to kick off Woman In Aerospace 2012.

You were kind enough to have me speak over 2 years ago – when I first began this position... I've not addressed the group since (other than speaking at mentoring sessions etc.) But as mentioned, I have a long history with WIA...

- The founders were my mentors (Marcia, Teresa, Kate)
- WIA gave me my first baby shower (Wes at WIA event at 8 days old)

It is a very important organization and it is gratifying to see how it has evolved. It is an honor to be invited to address you again. (Harry Truman said “if you want a friend in Washington, get a dog”... obviously he didn't have WIA! (I still have a dog, for “back-up”) !

Thinking about the theme of today's conference and my talk, “Leading the Way” gave me a few things to ponder this past week...I was in Japan, meeting with aerospace leaders as we watched space events here in the US. This opportunity (fueled by long flights) allowed me to reflect on what real leadership means and how NASA is really stepping up to that challenges of the future. I am a bit of a procrastinator, (and a bit busy these days), so when I started asking around yesterday afternoon what I should talk about this morning the most frequent response was simply “gloat”... but instead – I decided to outline how NASA is truly “Leading the Way” in space activities globally... (ok, so to some – that may end up being the same thing as “gloating”) and what a bright future I believe we have!

You all are extremely important to our successfully “Leading the Way” in the future, so with all of your involvement, I believe it will truly be a bright future.

As we at NASA work to secure the \$17.7 billion budget that President Obama has put forth, we are under increased pressure to justify America’s space program in light of so many other pressing world problems here on the Earth. I, for one, welcome the opportunity. It is a special privilege to carry out the public trust and with that trust, comes responsibility. Our government investments in space should always contribute to the general welfare and security of the United States (as mandated in our founding documents the 1958 NASA Space Act). The Act declares our policy and purpose which include (in this order):

- 1) Devotion of space activities to peaceful purposes for the benefit of all humankind
 - 2) For the welfare and security of the United States
 - 3) To seek and encourage, to the maximum extent possible, the fullest commercial use of space
 - 4) Contribute materially to one or more of the following objectives: expansion of human knowledge of the earth and space; improve the usefulness, speed, performance, safety and efficiency of aeronautical and space vehicles; develop and operate vehicles capable of carrying instruments, equipment, supplies, and living organisms through space; study the potential benefits to be gained from these investments; preserve the role of the US as a leader in these technologies and in the application thereof; make information available to other US agencies
- (**Cooperation by the United States with other nations and groups of nations in work done pursuant to this chapter and in the peaceful application of the results

thereof); utilize the resources of other US national agencies; preserve the preeminent position of the US through research and technology development related to associated manufacturing processes.

5) Ground Propulsion Systems Research and Development

6) Bioengineering Research

7) Warning and Mitigation of Potential Hazards of Near Earth Objects.

These last three purposes are all followed by the statement “Congress declares that the general welfare of the United States requires that the unique competence of the Administration be directed toward...

So the fact is, that NASA was specifically FOUNDED to play an indispensable role in improving the general welfare of society and in advancing our economic and national security. So I believe our challenge is primarily to best align our programs with those goals, and to communicate how we are doing that to Congress and to the American people. That shouldn't be too hard right? Well, for many reasons not, the least of these is it a bit challenging. As you may have heard, last year, the President's NASA budget request was cut nearly \$1B by Congress. And this year, some of the very programs which specifically align to these founding NASA purposes are not being fully funded and despite the heroic efforts of some of our best friends in Congress, we are likely to again see a lower overall top line budget for NASA.

It is my belief that the only way to turn around this budget trend (in these difficult economic times) is to better align our programs with these critically important objectives, so that our efforts, and space activities around the globe can more

effectively address these purposes and to better communicate how our activities contribute to solving these global challenges, benefit humanity and provide economic growth. While we have incredible support from those Members of Congress with constituent interest in NASA, we need to help those Members (supporters) by gaining broader support beyond our traditional States and districts.

I'd note that...although there is always room for improvement – and many of us are often critical of our efforts – I'd say NASA has and is doing an amazing job of not only providing real benefits, but in communicating them to the public...

NASA is the 2nd best recognized brand in world beyond the iphone...better than NASA because you spend a lot more on it.

But what benefits do we provide..how are we doing?

In the beginning, NASA “came from behind”... Early in the space age, it was the Russians “Leading the Way”. Fifty-one years ago, Yuri Gagarin, became the first human to orbit the Earth. But over 10 years later, America’s historic 1969 Moon landing was fueled by the sweat and dreams of generations of scientists and engineers, from the brilliant Italian Galileo to the brilliant German, Dr. Wernher von Braun and his team of rocket scientists. On the anniversary of Gagarin’s flight earlier this year, Charlie Bolden presented an address to the United Nations. He stated that “there is something intrinsically unifying about humankind’s exploration of the heavens. Beyond the scientific and economic benefits of launching into space – of literally leaving this planet – I can tell you that when viewed from orbit, our borderless Earth inspires a sense of humility, unity of humanity and wonder. As the great British astronomer Sir Fred Hoyle said in 1948, “Once a photograph of

the Earth, taken from outside, is available, a new idea as powerful as any in history will be let loose.” In my view, it is impossible to put a price on that benefit.

Given this amazing history AND where we stand today with our cooperative space programs, isn't it likely that our successes of the future will be fueled by the sweat and dreams of teams from around the world and from the private sector? Consider how these partnerships in turn, will help usher in an era of global stability and economic prosperity for the benefit of humanity? All for less than ½ a percent of your tax dollar!

NASA has a long history of international cooperation across a wide variety of space activities. (as I just mentioned in Charlie's UN remarks...) and the fact that, (as I also just mentioned) “cooperation with other nations and groups of nations” in the peaceful exploration of space is a key purpose of the Space Act of 1958. While we are proud of NASA's global leadership and we work to keep it, we are also mindful that the scientific and human space flight achievements of the past half century would not have been possible without international collaboration (even if that is sometimes spurring competition). While the Cold War rivalries that once existed have changed, the geopolitical world order continues to drive space investments. President Obama has made space activities key elements of America's commitment to building a more peaceful world. In his speech at the Kennedy Space Center two years ago, he said, “No longer are we racing against an adversary; in fact, what was once a global competition has long since become a global collaboration.”

Since NASA's founding 52 years ago, international cooperation has been one of our cornerstones. We have entered into about 4000 agreements in that time with more than 120 nations, touching almost every aspect of NASA's activities.

Right now NASA has 535 active international agreements, conducting some form of ground-based or space-based research linked to every continent and working with nations around the world to develop and implement the next generation of space exploration missions. Perhaps the most visible example of that cooperation is the International Space Station (ISS).

In addition to all the science and research on human health that has been and continues to be conducted on the ISS, one of the Station's historic achievements is how it demonstrates that many nations can work together on a project of enormous scope, complete it and then keep it going. Fifteen nations contributed to the development and assembly of the ISS and even more are or will soon become involved in the program through their utilization of this amazing orbiting research facility.

But in addition to those global benefits from international cooperation... space exploration is playing a big role in helping developing regions -- better cope with environmental, energy and health challenges that affect us all. Space technology has improved life here on Earth -- from the development of life saving vaccines to the efforts now underway by NASA and the FAA to make commercial airline transportation safer, quieter and more energy efficient. Let me highlight a few recent developments. One year ago, NASA signed a five-year memorandum of understanding with USAID creating NASA's SERVIR program which integrates satellite observations, ground-based data, and forecast models to monitor and forecast environmental changes and improve response to natural disasters in Central America, the Caribbean, Africa and the Himalayas. This effort is helping inform decision making in the areas of climate change, health, environment, agriculture, water and weather.

NASA's Earth Applications programs promote and fund activities that discover and demonstrate innovative uses and practical benefits of NASA's Earth science resources. NASA is partnering with public and private organizations to apply NASA scientific findings and Earth observing data to decision-making activities in areas such as Ecological Forecasting...utilizing data gathered by the Terra and Aqua satellites to model water prediction and tracking for use by water resource managers to help determine how much and when, water should be diverted for public use.

And on March 22nd of this year – World Water Day -- I joined U.S. Secretary of State Hillary Clinton in launching the U.S. Water Partnership, a new public-private partnership that seeks to mobilize U.S. based knowledge, expertise and resources to improve water security around the world, particularly in those countries most in need. Did you know that there are over one billion people on this planet without immediate access to clean water? In just one day, women and girls around the world devote 200 million work hours collecting water for their families. NASA's Earth observation research capabilities in space are contributing to new knowledge to tackle the global water challenge and accelerate the time when those hours can be spent productively in school and at work and with their families.

But in addition to those benefits... how about something closer to home...? How about advancing the US aerospace industries competitiveness and innovation, providing economic growth for the Nation? Our best example of NASA leading this effort today is in commercial space transportation, which is vital to the future of human space exploration AND to the strengthening of the American economy. As we chart a new course to send humans deeper into space than ever before, we are

stimulating innovation within the private sector to develop and operate safe, reliable and affordable commercial space transportation systems.

As you may have heard, we are committed to ensuring that American companies, launching from U.S. soil, transport our astronauts and their cargo to the International Space Station and other low Earth orbit destinations. It seems like just yesterday, that a private company returned cargo from the International Space Station – something previously only accomplished by the U.S. and Russian Governments (at significantly higher costs)... oh yea – it was just yesterday!! Congratulations to SpaceX and the NASA team!

We are on track to see additional commercial flights to the ISS this year and we remain committed to have American companies transporting our astronauts to and from Station by 2017, ending the outsourcing of this work. This approach will provide assured access to the station, strengthen America's space industry, and provide a catalyst for future business ventures to capitalize on affordable access to space.

As you all are aware, NASA is currently reviewing proposals for the next round of commercial crew acquisition activities. But what does this capability enable? Let's review: Certainly reliable, redundant access to the ISS (our national laboratory and our toe-hold for space exploration), is our first and foremost goal.

But everything we do in space will be advanced by more affordable and efficient space access: more satellites for Ecological forecasting, water resource management, disaster prediction and response, solar storm prediction, planetary exploration, asteroid detection, unlocking the mysteries of the universe, helping to keep our service men and women overseas safe by providing better communications and positioning information, and increasing our economic security

by re-entering the commercial launch market (billions of dollars a year market) which we have nearly completely lost in the past 15 years.

There are many other important benefits from NASA investments. If there was any question that America stands ready to continue Lead the Way in this next era of space and exploration and development, talk to any of our international partners about which Nation is leading and why? Total of all other budgets = $\frac{3}{4}$ NASA. We have the vision, the strategy, the public and political support to continue to deliver on the Promise of the space as envisioned in the 1958 Space Act and we welcome the support and participation of all of you, in achieving these ambitious goals.

NASA's vision is to reach for new heights and reveal the unknown so that what we do and learn will benefit all humankind. Space exploration, development and utilization strengthens us all, through global partnerships, through the new discoveries we make, and through the many technologies that are developed to improve life on Earth. We are committed to a space program that advances the human condition, as well as the human spirit.

So as I stated at the beginning of my talk, I believe NASA will continue to lead the way and that our future is bright. To make my final case to convince you, I've created one of my famous "Top Ten lists"... these are the: Top Ten reasons space will continue to be a great career choice: (I couldn't decide whether you really wanted a policy talk or a WIA career talk – so you got a policy talk with a WIA career top 10 list...

#10 – over 50% of economic growth is attributed to technological change – space is at the absolute cutting edge of making technological change and stands to benefit global economic security more than any other investment.

#9 -- R&D investments (like NASA and other government space agencies) create entire new industries (ARPA-NET – led to internet, NASA and other space agency investments led to the communications satellite industry, remote sensing, GPS)

#8 -- This industry has unlimited growth potential... The limitless possibilities for new industries with positive rates of return are unmatched. Last year in the US alone, the space industry exported billions of dollars. Conservative estimates of private rate of return of R&D range from 20 – 30%. Conservative estimates of social rate of return of R&D range from 35 – 50%... (and speaking of social benefits...)

#7 - Space assets and investments allow us to improve and save thousands of lives through a myriad of activities such as: instantaneous communications, disaster monitoring, ecological forecasting, water resource management, disease mitigation, solar radiation prediction and climate and weather monitoring.

#6 – We actually really need you. NASA is one of the top federal employers of STEM graduates...and... just 20% of NASA STEM employees are women...(are we 50% of the population?)

#5 – It is through space research that we will solve the really big questions for humanity: Where did life begin? Where are we going? Are we alone?

#4 –If you have a career in space – I promise you will always get invited to give talks at career day at your kids schools...

#3 – Do you really want humans to be a single planet species? You do remember what happened to the dinosaurs, right?

#2 – that many billionaires can't be wrong? (Jeff Bezos, Elon Musk, Paul Allen, Larry Paige, Sergey Brin, Eric Schmitt, John Carmak). The joke has been that the best way to become a millionaire in space is to start as a billionaire, but they are clearly onto something...

#1 Reason why Space is a great career choice— space activities promise to deliver the most meaningful, positive advancements for human society, and we need your knowledge and innovative spirit to force us and focus us on delivering this promise.

Thank you again for inviting me back. I'll be happy to answer any of your questions.